

***FlyBy Math™* Alignment**
Mathematics Grade Expectations

Standard 7.6: Arithmetic, Number, and Operation Concepts

Grade Expectations

M6: 1 Demonstrates conceptual understanding of rational numbers with respect to ratios (comparison of two whole numbers by division a/b , $a : b$, and $a \div b$, where $b \neq 0$); and **rates** (e.g., a out of b , 25%) **using models, explanations, or other representations.***

Demonstrates conceptual understanding of proportional reasoning, and fluently moves between equivalent representations of commonly used fractions and decimals.

M(N&O)-6-1

***FlyBy Math™* Activities**

--Apply mathematics to solving distance, rate, and time problems for aircraft conflict scenarios.

--Represent distance, speed, and time relationships for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system.

--Use graphs to compare airspace scenarios for both the same and different starting conditions and the same and different constant (fixed) rates.

M6: 7 Estimates and evaluates the reasonableness of solutions appropriate to grade level.

--Predict outcomes and explain results of mathematical models and experiments.

Standard 7.7: Geometry and Measurement Concepts

Grade Expectations

M6: 15 Measures and uses units of measures appropriately and consistently, and makes conversions within systems when solving problems across the content strands. (Benchmarks in Appendix B.) M(G&M)-6-7

***FlyBy Math™* Activities**

--Calculate and measure the position and time of simulated aircraft. Represent that motion using tables, graphs, equations, and experimentation.

M6: 18 Solves problems using the Cartesian coordinate system (all quadrants) **to** locate coordinates and to represent data from tables.

--Plot points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system to describe the motion of two airplanes.

--Represent distance, speed, and time relationships for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system.

Standard 7.8: Functions and Algebra Concepts

Grade Expectations

M6: 19 Identifies and extends to specific cases a variety of patterns (linear and nonlinear) represented in models, tables, sequences, graphs, or in problem situations; or writes a rule

***FlyBy Math™* Activities**

--Predict the relative motion of two airplanes on given paths.

--Represent distance, speed, and time relationships for

<p>in words or symbols for finding specific cases of a linear relationship; or <u>writes a rule in words or^{sc} symbols for finding specific cases of a nonlinear relationship</u>; and <u>writes an expression or^{sc} equation using words or^{sc} symbols to express the generalization of a linear relationship (e.g., twice the term number plus 1 or^{sc} $2n + 1$).</u>M(F&A)–6–1</p>	<p>constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system.</p>
<p>M6: 20 Demonstrates conceptual understanding of linear relationships ($y = kx$; $y = mx + b$) as a constant rate of change by constructing or interpreting graphs of real occurrences and describing the slope of linear relationships (faster, slower, greater, or smaller) in a variety of problem situations; and describes how change in the value of one variable relates to change in the value of a second variable in problem situations with constant rates of change. M(F&A)–6–2</p>	<p>--Represent distance, speed, and time relationships for constant speed cases using linear equations and a Cartesian coordinate system.</p> <p>--Use graphs to compare airspace scenarios for both the same and different starting conditions and the same and different constant (fixed) rates.</p> <p>--Interpret the slope of a line in the context of a distance-rate-time problem.</p>

Standard 7.9: Data, Statistics, and Probability Concepts

Grade Expectations	<i>FlyBy Math™</i> Activities
<p>M6: 23 Interprets a given representation (circle graphs, line graphs, or stem-and-leaf plots) to answer questions related to the data, to analyze the data to formulate or justify conclusions, to make predictions, or to solve problems. (IMPORTANT: <i>Analyzes data consistent with concepts and skills in M6: 24.</i>) M(DSP)–6–1</p> <p>And (frequency charts, line graphs, Venn diagrams, <u>pictographs, line plots, histograms</u>).</p>	<p>--Use tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes.</p> <p>--Explain and justify solutions regarding the motion of two airplanes using the results of plotting points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system.</p>
<p>M6: 25 Organizes and displays data using bar graphs, tables, frequency tables, line plots, <u>circle graphs, and stem-and-leaf plots</u> to answer question related to the data, to analyze the data to formulate or justify conclusions, or to make predictions.</p> <p>(IMPORTANT: <i>Analyzes data consistent with concepts and skills in M6: 24.</i>)</p>	<p>--Choose among tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes.</p> <p>--Explain and justify solutions regarding the motion of two airplanes using the results of plotting points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system.</p>

<p>M6: 28 In response to a teacher - or student-generated question, <u>makes</u> a hypothesis, collects appropriate data, organizes the data, appropriately displays/represents numerical and/or categorical data, analyzes the data to draw conclusions about the questions or hypothesis being tested, and when appropriate makes predictions, asks new questions, or makes connections to real-world situations.</p> <p>(IMPORTANT: <i>Analyzes data consistent with concepts and skills in M6: 24.</i>)</p>	<p>--Conduct simulation and measurement for several aircraft conflict problems.</p> <p>--Use tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes.</p> <p>--Use tables, bar graphs, line graphs, equations, and a Cartesian coordinate system to draw conclusions.</p>
--	--

Standard 2.5: Mathematical Dimensions, Standard 7.10: Mathematical Problem Solving and Reasoning - Applications

Grade Expectations	<i>FlyBy Math™</i> Activities
<p>M6: 30 Demonstrate understanding of mathematical problem solving and communication through:</p> <ul style="list-style-type: none"> • Approach & Reasoning—The reasoning, strategies, and skills used to solve the problem; • Connections—Demonstration of observations, applications, extensions, and generalizations; • Solution—All of the work that was done to solve the problem, including the answer; • Mathematical Language—The use of mathematical language in communicating the solution; • Mathematical Representation—The use of mathematical representation to communicate the solution; and • Documentation—Presentation of the solution. 	<p>--Apply mathematics to solving distance, rate, and time problems for aircraft conflict scenarios.</p> <p>--Explain and justify solutions regarding the motion of two airplanes using the results of plotting points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system.</p>